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Aluminium.

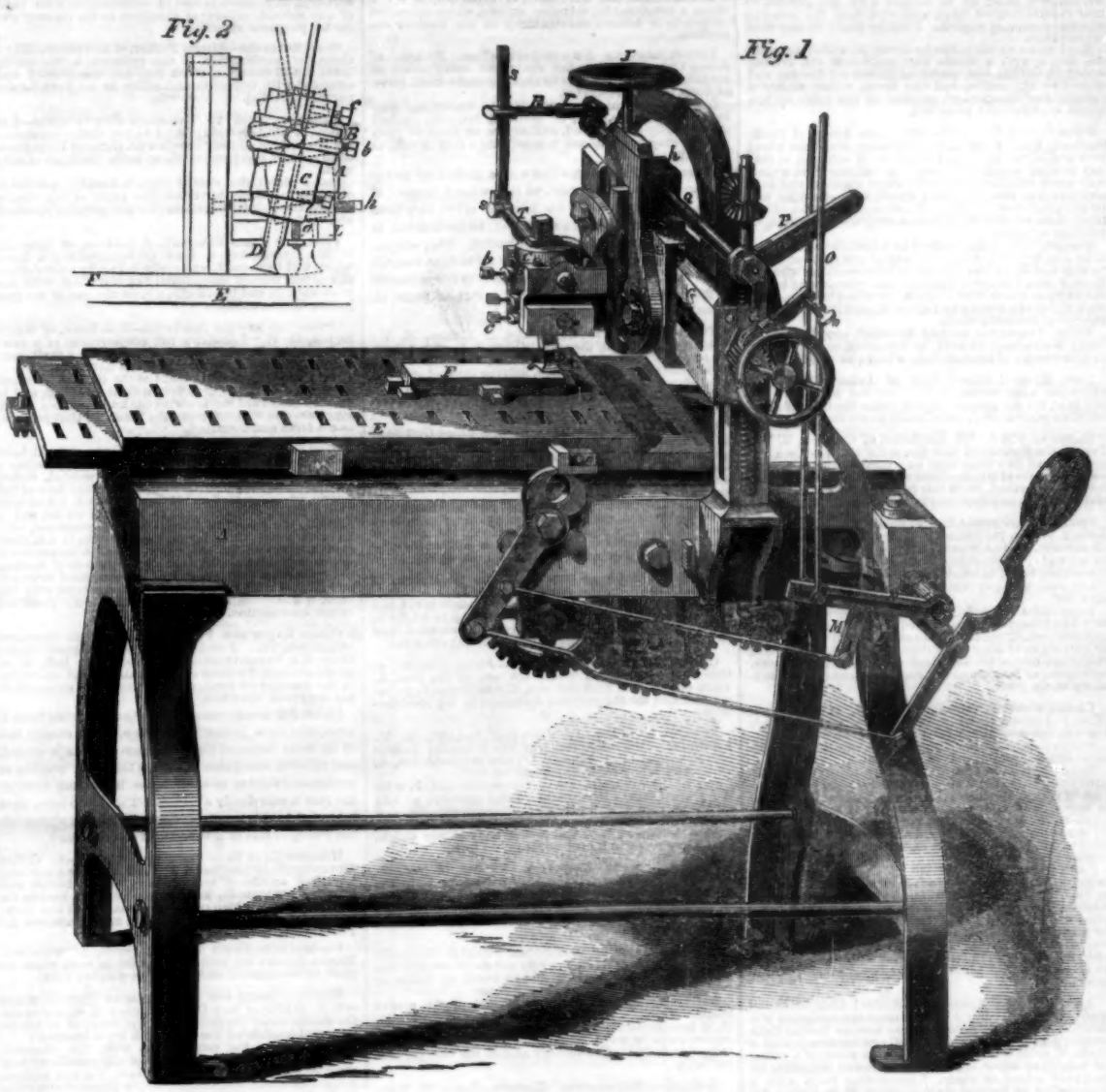
M. St. Claire Deville lately delivered a lecture before the Society for the Encouragement of National Industry at Paris, on aluminium, in which he gave some interesting facts in relation to its properties, and the progress made toward its general introduction. Under the skillful hand of this celebrated manipulator, it has been reduced to a beautiful white metal, with a slight bluish tinge, easily worked, more easily melted than silver, remarkably well adapted for gilding, and, in short, capable of being applied to many manufacturing honsehold purposes. It has taken its place, in fact, among metallic substances as much as iron, brass or any other metal. The extraction of this new element of beauty and utility from the commonest clay is only another evidence of the scientific knowledge derived by the world from the noiseless operations in the chemical laboratory. The processes by which the object is attained are complicated as yet, it is true, but they are becoming less so in the same manner that all the now well established manufactures have. Three foundries have commenced the fabrication of this metal in France, and M. Deville now disposes of many hundred weight per annum. The price at present is 300 francs per kilogramme, or about $27 per pound; but even under the present system of production, it might easily be reduced to 200 francs, were it manufactured on a large scale. The distinguished discoverer of this metal looks forward to the period when it will supersede the more precious metal in the fabrication of numberless articles of adornment and use.

Recorded Register for Gas Meters.

At present no uniform method is observed by the consumers of gas for keeping a check upon the inspectors who examine the meters monthly, and take down, for the accounts of the gas companies, the amounts consumed. The monthly inspectors may make false entries, and the consumers of gas thereby suffer. To afford a check against such a result, Mr. A. N. Brewer, of this city, has designed a tabulated index to hang up beside each meter for the inspector to enter the amount registered on the index of the meter, and the quantity consumed during the month. These entries will enable the consumer to examine the meter for himself, and to keep a check upon the inspector and the bills of the gas company. It is a very useful improvement, and it is surprising that something of the kind has not come into general use long before this.

The Senate has passed a bill giving $20,000 to Edward N. Kent, in full compensation for the use in the United States Mints of his apparatus to separate gold and silver, and other precious metals. It was illustrated on page 81, Vol. XI., SCIENTIFIC AMERICAN.

MASON'S CUTTER STOCK FOR PLANERS.



There is a great waste of time in the ordinary metal planing machines which will only cut in the one direction, and hitherto there has been some practical difficulty attending the machines which cut both in the back and forward movements of the bed. The machine illustrated in our engravings, (and the cutter stock of which is the invention of Joshua Mason, of Paterson, N. J., and was patented by him July 22, 1856,) is, we think, the best produced for its purpose. One tool does the cutting, and it is not turned or rotated, but is provided with a double edge, and is so mounted in a movable cutter stock that, whichever way the metal to be cut is moving, a cutting edge is presented to it at exactly the right angle to take off a shaving the same thickness as the preceding one.

Fig. 1 is a perspective view of a planing machine with this cutter stock and operating parts attached, and Fig. 2 is a view of the same separate, showing the cutter in the two positions, one in line and the other dotted.

A is the frame of the planing machine, carrying a bed, E, to which is secured the piece of metal, F, to be planed or cut even by the tool, D. This tool is of peculiar form, having two cutting edges, seen better in Fig. 2, each of which can be ground independent of the other, or exactly alike, and by regulating the feed motion it can be made to go with one edge in one direction over the stuff, taking off a shaving, and at the return stroke or motion of the bed, it can take, with its other edge, a finer shaving off the same surface, thus finishing each cut as made, or it can cut at each motion a shaving in advance of the last, and dress after. The tool is mounted in a cutter stock, C, by means of set screws, *b c*, and the stock can move in a frame, I, by being supported by the pins, *a*, projecting from the belt, B, and moving in journals in I.

The manner in which it is moved is as follows:—On E are two movable stops, *e*, that can be put and secured in the proper positions by set screws, which, when the bed has got to the end of its traverse in one direction, throw the clutch, K, over, and so by a system of levers, connecting rods, and wheels, as in ordinary planers, reverses the motion of the bed. To this clutch, K, there is also attached another connecting rod, L, that is attached and gives motion to the bell crank, M N, to which are connected by a screw the rods, O; to one rod, O, is secured a toothed piece, *i*, by a screw, *o*, and this working on a ratchet wheel moves a screw that propels the frame, H, along the slide, G; this can also be done by the hand wheel, *g*, at the commencement, to bring the tool over the piece to be cut. To the other of the rods, O, at or near its top, is attached a lever, P, which moves a shaft or bar, Q, and this has a piece, R, jointed to it at *r*, the other end of which passes over (by a slot in it) the piece, S, hinged to the axle, T, of the cutter box, C. It will be seen from this arrangement of levers and rods, that as the clutch, K, is thrown over, and the motion of the bed reversed, at the same time the cutter is changed from the angle at which it has been cutting with one edge to the same angle with the other edge, and has also been advanced one shaving or not, as desired; the frame, I, which supports the cutter stock, is raised or lowered on H by the wheel, I, and Q passes completely through the box, *h*, that helps to support H on G.

This arrangement can be attached to any planer, and will prove a great saving of time wherever it is used. Any information that may be desired can be obtained by addressing the inventor as above.

An Orthodox Subscriber.

One of our subscribers, who is an attorney-at-law in a thrifty village in Pennsylvania, writes to us in the following sensible manner:

"I am strictly orthodox, and I would as soon think of raising my family without the Bible in the house, as doing business without your paper in my office. I have been a regular subscriber to the SCIENTIFIC AMERICAN for a number of years."

Issued from the United States Patent Office

FOR THE WEEK ENDING APRIL 20, 1858.

[Reported officially for the Scientific American.]

HORSE HAY RAKES—N. E. Allen, of Trenton, Wis.: I am aware that rakes have been held until released by the operator, but heretofore the rake teeth, or their equivalents, must be in contact with the ground, so that contact rotated them, and even then the rotation was not positively certain. I lay no claim to any such contrivance.

But I claim so connecting a lever, H, which actuates the dog, c, with a clutch that gears with the driving wheel, D, as that one operation throws out the dog and throws in the clutch, and vice versa, which makes a positive and compulsory rotation of the rake by the means set forth and described.

GEARING FOR HORSE POWER—Cyrus Avery, of Tunkhannock, Pa.: I claim, first, forming the main wheel with a wide periphery cast whole or in sections, so that any desired number of series of intermediate wheels may work within it, one series above another, and each series to gear into the main wheel, thus enabling me, by slipping on or shipping off one or more series of intermediate wheels, to produce a very low, very high, or medium velocity.

Second, I claim the method by which the main wheel is kept in position, viz., by means of a thimble attached to the center of the bed plate in connection with the flanges upon the lower intermediate wheels, and by the flange upon the outside of the main wheel in connection with the circle around and above it, and by the pivot at the top of the main shaft.

Third, I claim the method by which any desired velocity is obtained, namely, by removing or adding one or more series of intermediate wheels, as described.

LIFE BOAT—Leverett Ball, of Auburn, N. Y.: I claim the combination of the described doors with the life boat, for the purpose of preserving the lives of shipwrecked passengers, substantially as set forth.

DRESSING SAWS—Job Batchelor, of Camden, N. Y.: I claim the horizontal disk file, a, for the purposes described, and its connection and combination with the movable parts of the machine by which the same is operated as described, the whole being combined, arranged and operating substantially in the manner set forth.

SEWING MACHINES—Chas. F. Bosworth, of Petersham, Mass.: I claim the jointed rocking feed hand constructed and arranged as described, so as to play freely between and upon two fulcra when operating from beneath the sewing table, in combination with the pressure pad above said table, in the manner and for the purpose specified.

I also claim regulating the angle of vibration of the feed hand constructed, arranged, and operating as herein described, by means of two stops, one of which is so adjustable as to allow the fulcrum upon which the said feed hand moves to be raised or lowered, thereby diminishing or increasing the feed at pleasure, substantially as set forth.

RUNNERS OF SLEDS—Silas Bullard, of Hartland, Mich.: I do not claim giving a movement to sleigh runners independent of the load that is above them.

Nor do I claim giving the runner on one side a movement independent of that of the other.

Nor do I claim the use of the link joint for connecting sleigh runners to the frame-work of a sleigh.

But I claim constructing the rear runners of sleighs in separate frames, each frame being hung by link joints to the cross-bar, H, so as to admit of a fore and aft rising and pitching movement in each runner which shall be independent of the movement of the opposite runner as set forth.

I also claim the construction of the tie beam, H, so contrived as to hold the separate forward runner frames at the proper distance apart by the fastening bolts, B h, near its ends, and at the same time to allow the independent rising and pitching movement in each runner by making the mortise holes in H', so large as to admit the bars, E' E', to play loosely therein, so as to allow of a slight rolling motion on the axis of H', whenever the runners rise or pitch from the irregularities of the ground.

AIR PUMP AND GASOMETER—Samuel Chichester, of Poughkeepsie, N. Y.: I claim a machine composed of a reservoir and two pumps, whose pistons having their weight proportioned as described, are combined with a shaft, K, or its equivalent, to which the power of a spring or weight, or other constant first mover is applied by means of a cord or chain, f, connecting them with a loose pulley on the said shaft, a wheel, M, fast upon the said shaft, a stop for acting on the said wheel to stop the shaft, and a proper contrivance for engaging the loose pulley with, and disengaging it from the shaft, the whole operating substantially as described, for the purpose set forth.

[See a description in another portion of this paper.]

SHARPENING DEVICE FOR ROTARY CUTTERS—Edward Conroy, of Boston, Mass.: I do not claim broadly the idea of rendering revolving cutters self-sharpening by bringing their edges into contact with a sharpening instrument.

But I claim the sharpening device, H, when arranged and employed, substantially in the manner shown and described.

[A notice of this invention will be found on another page.]

CROSS-CUT SAWING MACHINE—Richard M. Cosby, of Indianapolis, Ind.: I claim no gain of power by leverage, nor any of the parts described, when taken separately, as new.

But I claim the combination of the rocking lever, K, spring, c, and weight, J, with the saw frame as described and shown.

COOLING AND DRYING MEAL—John Deuchfield, of Oswego, N. Y.: I do not claim forcing a current of air between a pair of mill-stones, while the same are in operation, for the purpose of keeping the stones in a cool state and preventing the heating of the grain, for such means, although not very efficient, have been previously used.

But I am not aware that parts arranged as herein shown, so as to allow the meal to be subjected to the blast during its entire, or nearly entire passage from the stones to the bolts, and insure the perfect cooling and drying of the meal, have been previously used.

I claim, therefore, the arrangement and combination of the chests, D J, shafts, F K, elevators, F', fan, G, and spout, I, substantially as and for the purpose shown and described.

[A description will be found on another page.]

PORTABLE INVALID BEDSTEADS—Zebulon C. Favor, of Chicago, Ill.: I claim the arrangement in an invalid cot bedstead embracing the following several features, to wit.: two slotted straps, G G', two stop pins, j j, two loops, k, turning thimble eyes, D D, punctured stripe, s s, beveled rails, A A, obliquely set pivoted legs, B, and turning thimble stop catches, C, in the manner specified, and for the purpose of producing an improved new article of manufacture of the character set forth.

[See another page for a description of this improvement.]

PLATFORM SCALES—Chas. H. Earle, of Green Bay, Wis.: I claim, first, supporting the platform by plates, I I', arranged as shown, and connecting the platform with the beam, Q, by means of the bent lever, O, rod, N, and arm, M, or an equivalent device, for the purpose specified.

Second, The auxiliary weight formed of the chain, U, in connection with the cup, T, arranged as shown, or in any equivalent way to operate as and for the purpose set forth.

[This invention consists in a peculiar arrangement of means employed for connecting the scale beam with the platform, whereby the construction of the platform scales is simplified, the parts made less liable to get out of repair, and the operation more perfect than usual.]

DRIVING WHEELS OF LOCOMOTIVE ENGINES—John F. Elliott, of New Haven, Conn.: I claim the combination with the legs, E E, operated as described, of the feet, D D, jointed to the said legs, and connected together by chains, to operate substantially as set forth.

[A description of this invention will be found on another page.]

BURNISHER—Chas. Frampton, of Brooklyn, N. Y.: I claim a burnisher for spinning screws, whose operative extremity is formed substantially in the manner described.

LIFE-PRESERVING BUCKET-RAFT—Chas. French, of Jersey City, N. J.: I do not claim the construction of buckets with air chambers in them to make them serve as floats or life-preservers.

But I claim furnishing buckets with encircling gaskets or grummets, d d, or their equivalents, applied substantially as described, so that two or more of such buckets may be combined to constitute a float or raft, as set forth.

[These buckets are provided with a gasket or grummet around their lower part, so that when a number of these buckets are pushed one into the other, they form a raft or life-preserver, on account of the air inclosed in the air-tight space between each bucket. They are excessively convenient, and are ready for instant use, not being at all in the way, and taking very few moments to put them together so as to form a raft of large dimensions and great buoyant power.]

FIELD FENCE—Benedict Gabriel, of Elmira, N. Y.: I claim constructing the post halves, A A, with points, f f, having their inner edges wedging, so as to force said points further apart in the act, driving the post into the ground, arranged in combination with the step, B B, substantially in the manner and for the purpose specified.

TREATMENT OF SULPHURETTED ORES—Isaac Gattman, of Philadelphia, Pa.: I am aware that caustic, carbonate, and sulphate of potash or soda have been used before in the working of the native metallic sulphurets, and I therefore do not claim their use as such exclusively.

But I claim the use of sulphuric acid in connection with the hydrate, carbonate, or sulphate of potash or soda, or with any compound thereof, in the mode of working the native metallic sulphurets, substantially in the manner set forth, and for the purpose specified.

RAILS FOR STREET RAILROADS—John B. Henck, of Boston, Mass.: I claim in a cast-iron rail the combination of the supporting lap and dove-tailed dowel, the said dove-tail being cast on the said lap as set forth, whereby the rails are rigidly locked and prevented from rising or falling, or moving in either lateral direction.

CLENCHING HORSE-SHOE NAILS—James Houck, of Green Castle, Ind.: I claim the use of the post, A, when constructed with the cap, C, and band, B, in the manner and for the purposes described in my specification.

RUNNERS OF SLEDS—John Hoyt, of Fishkill, N. Y. I claim, first, the combination of the T-headed noddle pin, P, with the dog joints, D D', and the front bob, A, as described, and for the purposes set forth.

Second, The combination of the noddle pin, P, with the jointed reach, R, constructed and operated as and for the purpose described.

Third, The attachment of the rear bob, X, to the double cranked axle, F, and to the body of the sleigh, in the manner and for the purposes set forth.

STEAM GOVERNOR—Roswell D. Jacobus, of Newark, N. J.: I claim using a distinct motive power from the main engine with the motive power of the main engine to operate a governor in combination with machinery constructed in the same or similar manner, and for the purposes specified.

CENTER-BOARDS OF NAVIGABLE VESSELS—Benjamin Joline, of Westfield, N. Y.: I do not claim broadly suspending a center board within its trunk by chains or ropes, for this has been previously done.

But I claim suspending the front end of the center board, C, within its trunk, A, by means of the bridle, D, in combination with the bolt, e, and slot, d, or their equivalents, to serve as a guide, the parts being arranged to operate substantially as and for the purpose set forth.

OPERATING BLACKSMITHS' HAMMER—James W. Kerr, of Rochester, N. Y.: I do not claim the various parts of my automatic blacksmith separately considered.

But I claim the combination and arrangement of the eccentric, H, with the slotted reciprocating gate, I, and bellows, K, whereby the required motions for successfully operating the bellows are obtained by the revolutions of the balance wheel, G, in the manner and for the purpose herein set forth.

I also claim the combined operation of the wheel, G, with cam or cams, o, lever bar, M, hammer lever, f, hammer, L, and spring, d, whereby the power may be reciprocatingly employed between the actions of the bellows and trip hammer, so that the power released from one is expended on the other, and vice versa, substantially in the manner and for the purpose described.

UMBRELLAS—Henry Kurth, of Brooklyn, N. Y.: I claim making the rib by coiling the wire into loops, which serve, like ordinary holes in the rib, for the joints, and attaching the stretcher to the middle loop without the interposition of intermediate links, substantially in the manner and for the purpose as described.

HARVESTERS—Henry Marcellus, of Amsterdam, N. Y.: I do not claim the pole plank, E, with castor wheel, G, attached for relieving the draft pole of the weight of the front end of the machine when the sickle is raised, for that has been previously used.

Nor do I claim attaching the draft pole to the pole plank, irrespective of the particular arrangement, or the point where the pole is attached, as shown and described.

But I claim connecting the draft bars, a a, of the draft pole to the pole plank, E, at a point intermediate between its castor wheel, G, at the front end of the pole plank and the point of connection of the pole plank with the machine, substantially as shown and described for the purpose set forth.

[This invention relates to an improvement in that class of harvesters in which a pole plank is employed to serve as a rest for a lever by which the cutting device is raised and lowered. The invention consists in attaching the draft pole to the pole plank at a point intermediate between the castor wheel at the outer end of the pole plank and the point where the pole plank is connected with the machine, whereby many advantages are obtained.]

COMBINED COAL SCUTTLE AND ASH SIFTER—Archibald McNeill, of Washington, D. C.: I do not claim any of the parts described, separately.

But I claim a coal scuttle, A, provided with the extended scoop-shaped piece, D, slide, C, screen, E, and cover, G, all arranged and operating substantially and for the purpose as set forth and described.

POTATO PLANTER—F. S. McWhorter, of Smyrna, Del.: I claim the employment of a transverse hopper, I, having an inclined bottom, and arranged on one side of the endless chain conveyor, C, in combination with a longitudinal guide and retaining box, G H, which has its rear portion inclined and its front portion horizontal, and a brush, K, which brushes off any surplus pieces of potatoes which may collect in the cells or chambers of the endless conveyor, substantially as and for the purposes set forth.

[This machine consists of an endless chain of conveyors which continuously receive the pieces of potato from a side hopper, and carry them to a planting tube which conducts them into the ground. This is a simple arrangement and has been found in practice to be very well adapted for the purpose above named.

DOMESTIC MANGLE—Samuel Nowlan, of New York City: I do not confine myself to the application of mangles conducted and arranged as described, to bureaus only, as substantially the same principle of construction can be applied to any kind of furniture, such as wardrobes, tables, desks, etc.

I claim the mechanism of a mangle constructed and arranged in relation to and in combination with parts of any suitable articles of furniture in the manner and for the purposes specified.

CORN SHELLERS—Elmon Parker, of Baltimore, Md.: I claim the combination of the cylinder, A, the spring back, d, and rollers, e, when they are constructed and arranged with respect to each other, as set forth for the purpose specified.

SECURING TIRES TO RAILROAD CAR WHEELS—Lea Pusey, of Philadelphia, Pa.: I do not claim constructing locomotive and car wheels with plates or rings riveted to centers and tires, as these have been previously used.

But I claim the slotted ring, b, forming a series of openings to admit corresponding parts of the tire, c, passing through said openings for the purpose specified and set forth.

PORTABLE FIELD FENCE—L. S. Robison, of Gypsum, N. Y.: I claim any method of constructing a fence which will be portable and easily put up by means of the panels constructed substantially as described, with the cross bars, B, and the blocks, e e, on the end of the projecting horizontal bars.

OPERATING SEWING MACHINES—P. J. Steer, of Washington, D. C.: I disclaim the employment of a pawl and ratchet for the purpose of revolving a shaft continuously in one direction, as this is not new.

But I claim the arrangement of the devices for starting sewing machines always in a right direction, and to prevent backward motion with the knee and foot of the operator, and without using the hand for that purpose, as set forth and described.

RAILROAD RAILS—E. W. Stephens and Richard Jenkins, of Covington, Ky.: We claim constructing a tubular T rail when the walls, B B, are welded, forced or pressed together from C to C, or from the base of the rail up, as represented and before described, (or so near together, that when the weight is placed on the rail in using it, the walls will force together), combined, with the walls made concaving on their outside at d d, from near the top of the rail down, a short distance below where they are made to meet for the purpose of making the walls brace inwards, with which combined structure and form of rail we can make a stronger one with the same quantity of metal as mentioned and described in the specification.

CATCH LATCH FOR FARM GATES—Joseph Summers of Raleigh, Va.: I claim the peculiar formed spring plate, K g, in combination with the spring bolt, D, as an attachment for farm gates, arranged and operating in the manner set forth, for the purpose of accomplishing the result specified.

[With this arrangement the end of the spring latch is prevented from projecting out beyond the closing face of the front batten of the gate, when the gate is opened, and thus the annoyance of having the reins, gearing or garments catching upon the same in passing through the gate is completely avoided. Those who have been subjected to this inconvenience will readily appreciate the utility of this simple and neat contrivance.]

HOLLOW CAST IRON COOKING UTENSILS—A. V. Van Hovenbergh, of Southside, N. Y.: I claim as a new and improved article of manufacture, to wit, hollow cast iron cooking utensils, kettles, griddles, &c., having the interior surface which comes in contact with the cooking material polished by any of the usual processes for polishing metals.

BIT-HOLDER—David H. Whittemore, of Worcester Mass.: I claim the holder, C E, with its cam, when applied in the manner and for the purpose set forth.

METALLIC SHOES FOR THE BRACES OF TRUSS GIRDERS—T. B. White, of New Brighton, Pa.: I do not claim the double shoes irrespective of the mode of construction, and combining the same with truss bracing.

But I claim the combination with the diagonal braces, C C, in a truss girder of the peculiarly constructed metal male and female shoes, b c, and wedges, d d, substantially as specified, for the purposes of setting up the braces to give camber to, or to raise the girder as set forth.

[With this simple arrangement in truss girders for bridges, the diagonal braces can be set up so as to give the girder any amount of camber, or to raise it in case of settling too low, by the introduction of wedges between the male and female shoes without danger of crushing the ends of the braces, and without liability of their getting out of place or having a chance to play laterally or longitudinally. This is an important improvement in truss bridges.]

QUARTZ MILLS—L. W. Williams, of Nevada City, Cal.: I do not claim the circular battery, that being by no means new.

But I claim constructing the inside bottom of circular batteries (in which quartz is to be crushed) of a series of inclined planes or curved surfaces commencing at any desired base, and produced to any required hight, and over and in contact with which stampers or wheels are made to revolve and by their revolution over such inclines are alternately raised and let fall, substantially in the manner and for the purpose described.

CURTAIN FIXTURES—T. R. Work, of Hartford, Conn.: I do not claim, broadly, the application of friction rollers to the shade roller, nor do I claim any of the parts separately.

But I claim, first, The specified arrangement consisting of rollers, h h, bar, c, pin, e, yoke, c, case, A, endless band, F, roller, D, for the purpose set forth.

Second, I claim, in combination with the above, the plates, A A', constructed with projecting ears, a, as shown, so that the plates may be attached either to the front side of the window casing as may be desired.

[This invention consists in a novel application of friction rollers to a semi-circular yoke, the rollers and yoke being fitted within or to a case, and the whole arranged so that the shade or curtain may be retained at any desired point by friction produced by the pressure of the friction rollers on the shade roller, and the shade roller relieved of the friction whenever it is turned by the hand; the friction rollers causing the band to encircle the roller to an extent fully sufficient to ensure the rotation of the same, and the case which contains the friction rollers and yoke being so constructed that they may be applied at either side of the window, and either at the front or side of the window casing as may be desirable.]

SEED PLANTING HOES—Samuel Woodruff, of Sparta, N. J.: I am aware that seed distributing devices have been attached to hoes, and arranged in various ways, in order that the seed may be distributed, the holes made to receive it, and the seed covered at one operation, and I therefore do not claim separately any of the parts shown and described.

But I claim the box, B, provided with the valve, C, and plunger, D, attached to the hoe, and used in connection with the sack or receptacle, G, placed on the operator, and communicating with the box, B, by means of the flexible tube, E, the whole being arranged substantially as and for the purpose set forth.

[This invention consists in the employment of a small box attached to the back of the hoe, provided with a valve and plunger, and used in connection with a seed receptacle or sack which is slung around the shoulder of the operator, and made to communicate with the distributing device by means of a flexible tube. The device may be readily applied to any ordinary hoe, and used by the operator with the greatest facility, the seed being planted and covered by the implement equally as quick as the ordinary process of covering alone by means of the hoe.]

LIME KILNS—Bernard Zwart, of Keokuk, Iowa: I claim the construction of a division wall, B, in combination with the two adjoining fire-places, E, and walls, g', to secure the oven burning of both sides when desired.

I claim the combination of the solid spherical triangle I, in connection with the form of the canals from R down to K, for the uses and purposes as above more fully described.

I claim the particular construction of the hot air conductors, X, in combination with the division wall, B, and in combination with the draught flues, y, to procure the horizontal draft of hot air, and make the same serviceable, so as to act direct on the limestone in the manner and for the uses as fully described.

MACHINE FOR MAKING WOODEN DOWEL PINS—A. H. Boyd (assignor to S. F. Chase), of Saco, Me.: I claim, first, The slotted clamp carriage or bed-piece, in combination with a gang of two or more circular saws for splitting or cutting off wood, substantially as specified.

Second, The arrangement and adaptation of said circular cutters, in combination with said clamp carriages and circular saws, substantially as specified for the purpose specified.

REAPING MACHINES—J. W. Brokaw (assignor to W. Brokaw and child), of Springfield, O.: I claim the combination of an auxiliary platform, H, with the platform for the reception of the grain as it is cut, when arranged, constructed and operated in a space between the latter and the driving wheel, in the manner substantially as and for the purposes set forth.

SMOOTHING AND POLISHING IRON—F. A. Cannon (assignor to John Phillips), of Brooklyn, N. Y.: I claim the application and arrangement of rollers or cylinders to smoothing and polishing irons as described, by which a high degree of polish is imparted to linen and other fabrics with the least expenditure of muscular power.

MEAT CUTTERS—P. Demeure, of Brooklyn, N. Y., assignor to Chas Chepy, of New York City: I do not claim the original invention of S. Millet.

But what I claim as an improvement on the said patent of S. Millet, of May 24, 1853, is, first, The opening, l, in the cover, c, placed near the front part of said cover for the purposes and as specified.

Second, I claim the arrangement of the hinged cover, e, and latches, 5 5, in connection with the removable basin, d', for the purposes and as specified.

Third, I claim the arrangement of the cutters, 1 1, acting through slots in the cover, c, in opposite directions on the meat, &c., to be cut as the same is presented by the revolving basin, substantially as and for the purposes specified.

MANUFACTURE OF LEATHER, PASTEBOARD, AND PAPER—A. N. Mathieu, of Paris, France, assignor to M. J. A. Guiet, of New York City. Patented in France, Apoil 13, 1855: I do not claim the employment of leather in making pasteboard, &c., when the same is made to pass through a process of maceration with lime, or like substances, or when leather scraps are mixed with resinous or glutinous compounds to cause it to adhere, for all such modes are too expensive for practical use.

But I claim manufacturing pasteboard or paper of leather shavings by simply washing and grinding and mixing the same with vegetable fibers, without the adtion of other manipulation or material, by which I make a cheap and merchantable article when heretofore the process was too expensive for its profitable use.

METHOD OF VENTILATING RAILROAD CARS—Calvin Pepper (assignor to N. R. Scovel), of Albany, N. Y.: I claim the manner specified of purifying the air as it enters the car, by passing the same through the pneumometer composed of the tubes, b and c, in the water chamber, C, for the purposes and substantially as specified.

CASTING CAR WHEELS—Robert Poole (assignor to himself and G. H. Hunt), of Baltimore, Md.: I claim the base, A, of the flask made in sections, so that the center one may be removed without disturbing the remaining one, for the purpose set forth.

I also claim the sectional cope, C, so made that either section may be removed without disturbing the other one, for the purposes set forth.

I also claim, in combination with the sectional base and cope, the central member, B, of the flask, with a lining of some non-conducting material, substantially in the manner and for the purpose described.

HORSE SHOE MACHINE—Elwin Shaw, of Providence, R. I., and Calvin Carpenter, Jr., of Pawtucket, Mass., assignors to themselves and G. R. Justram, of said Providence: We claim varying the point at which the pressure for narrowing and thickening the heel commences, by moving the mold, K, in or out in the manner substantially as described.

CORN PLANTERS—George Taylor, of Richmond, Ind., assignor to himself and J. W. Free, of Laporte, Ind.: Now I do not claim any particular method for the distribution of the grain; but I disclaim the method shown, and all other methods of distribution, for I hold that what is strictly my invention is applicable to many or most methods or devices for distribution now in use.

Neither do I claim the devices shown for operating the distributing apparatus by means of inclined planes, j j, held in contact with cam, j, by means of a spring, S, as this contrivance is already before the public.

Nor yet do I broadly claim the use of either springs or weights for operating the marking contrivance.

But I claim, first, The combination of parts, j' j' l, shaft, L, and wheel, K, with slide, G, for the purpose of correcting the machine, and making it plant in line with work already done.

Second, I claim the weighted spring arms, p p, operated as shown, in combination with the devices shown for correcting the machine, when said spring arms are so situated as to mark midway between the rows of planting.

CHURN—James Macnish, of Berlin, Wis.: I claim the combination of a central spiral flanched or winged agitating shaft, C, with a series of encircling expressing rollers, A A, a portion of which have a direct motion in one direction, while the others have an indirect motion in an opposite direction.

RE-ISSUE.

POWER PRINTING PRESS—Isaac Adams, of Boston, Mass. Patented Oct. 4, 1830—extended for seven years from Oct. 4, 1844—extended by Congress from Aug. 16, 1856, to March 2, 1864—re-issue April 20, 1858: I claim, first, The method described, or any other substantially the same, for giving the bed its proper periods of motion and rest, and producing impressions by means of the combination consisting of the crank, D, the pitman, D', the declension lever, I 5 6, and the toggle joints, e' e'.

Second, I also claim the described method or any

equivalent mechanism for giving the proper periods of motion and rest to the frisket carriage, and each and all the parts attached to it by means of the combination consisting of the arm, o 4, the rocking bar, o 3, the incline plane by which said bar is disengaged, the shaft, O, and the crank, n, 13.

Third, I also claim the combination of one or more feed frames, with the frisket or friskets or mechanism for receiving the sheets to be printed, the same being substantially as set forth.

Fourth, I also claim the described mode or any other essentially the same of securing against the platen the sheet to be printed, whereby it is not only kept steady and prevented from bagging, but it is also, after the production of an impression upon it separated from the types in a proper and safe manner.

Fifth, I also claim constructing the pitman as described, or in any manner substantially the same, the bearing surface, i 1, the shoulder, i 2, and the joint, h 5, constituting its essential characteristics, so as to allow said pitman to be operated and to produce effects in the manner substantially as specified.

Sixth, I also claim, in combination with the described mechanism for producing the impressions, the treadle, K 4, or its equivalent, to prevent impressions being taken or produced while other parts of the press are in motion whenever such prevention may be desirable.

Seventh, I also claim the combination of the double frisket carriage, the bed, platen, and the rollers for inking the type with two sets of inking mechanism, the whole being made to operate together substantially as explained, and the several parts being constructed and connected substantially as set forth.

Eighth, I also claim the combination consisting of the platen (when constructed substantially as stated), the bed and distribution cylinders.

Ninth, I also claim the combination of a crank with the carriage, n 6, for the purpose of carrying the inking rollers over the form, and for giving the friskets, n', their proper motions and periods of rest.

Tenth, I also claim the mode of constructing the winter, E, or bottom bar, as shown in Figs. 8 and 34, or any equivalent device, by which inconvenient hight in the machine is avoided, said winter being made with a ledge or shoulder near its lower part upon which the toggle joints are sustained, substantially as described.

Eleventh, I also claim the combination of the fountain with one or more distribution cylinders, and a traveler, L, the same being for the supply and distribution of the ink, substantially as described.

Twelfth, I also claim placing the apparatus for the supply and distribution of ink, so that the distribution cylinders rest over or nearly over the fountain, the roller which takes the ink from the fountain roller being placed between the fountain and the cylinders, K 6, K 5, in the manner substantially as shown.

Thirteenth, I also claim the mode described of laying the ink upon the types by passing the rollers, K 5, K 6, between the bed and platen, said rollers being brought to a stand in their horizontal movement for the purpose of receiving their supply of ink from a cylinder or cylinders substantially as stated.

Fourteenth, I also claim the described mode by which the nuts, g' g', which sustain the impression are brought to their proper positions and secured there, that is, by the hoops, g 3, set screws, g 8, and pins, g 5, substantially as specified.

Fifteenth, I also claim the mode of producing the impressions by means of toggle joints applied to the under or reverse side of the bed, substantially as described.

Sixteenth, I also claim the combination of the rocker shaft, d 2, and the levers, d', with the bed, the same being for the purpose of keeping the bed level, substantially as described.

EXTENSION.

MACHINES FOR SPLITTING LEATHER—Alpha Richardson, of Boston, Mass. Patented April 16, 1844—extended April 16, 1858: I claim the arrangement specified of the gage and feed rollers of a leather splitting machine, so that the bilge of the lower side, or the axis of the former shall be directly over or in the same vertical plane with the edge of the knife, while the axis of the latter is a little distance out of said vertical plane, and its upper bilge is a little above the level of the edge of the knife for the purposes recited in the specification.

The Horse Power of Locomotives.

MESSRS. EDITORS—"What is the horse power of a locomotive under the following circumstances, namely, cylinders fifteen inches in diameter; stroke, twenty inches; driving wheels, five feet diameter; speed, forty miles per hour, with a working pressure of steam in the cylinder of one hundred pounds per inch, full stroke?"

I have worked out the question for myself, and have made the power of each cylinder 393 horse, nearly, or 787 total. An apprentice in a machine shop in this place recently asked me the above question, and when I gave him the foregoing answer, all the engineers in the shop laughed at me. I then asked quite a number of mechanics what was the power of such a locomotive, and they said from forty to eighty horse. An engineer of a locomotive of about the capacity given, told me that his engine was eighty horse power. There is either a very mistaken notion among mechanics generally concerning the power of locomotives, or else the rules laid down in books for estimating their horse power are not correct. Your opinion will throw light on the subject. G. B. F.

Canton, N. Y., April, 1858.

[Our correspondent is nearly right in the conclusions deducible from the question according to the data he has furnished. The nominal horse power of a locomotive of the dimensions given and performing, as described, is eight hundred. This is estimated by multiplying the pressure of the steam per inch on the area of piston into the velocity of the latter in feet per minute, and dividing the product by 33,000. The unit of a horse power is 33,000 pounds, lifted one foot per minute. In the above case, therefore, we have—

$15^2 \times .7854 = 176.715$ inches area of piston.

$5 \times 3.1416 = 15.708$ feet circumference driver wheel.

$5280 \div 15.708 = 336$ revolutions of wheel per mile.

$336 \times 40 \div 60 = 224$ revolutions driven per minute.

$224 \times 3\frac{1}{4} = 747$ feet (nearly) velocity of piston per minute.

Therefore, $176.715 \times 100 \times 747 \div 33{,}000 = 400 \times 2$ (cylinders) $= 800$ horse power.

A like result is obtained as follows:—$(15^2 \times 20 \times 40 \times 100) \div (5 \times 4500) = 800$.

This latter rule embraces the multiplying of the speed in miles per hour by the square of the diameter of the piston in inches, by the stroke in inches, by the effective mean pressure on the piston in pounds per inch, and dividing the product by the diameter of the driving wheel in feet, and by 4,500.

The *nominal* and the *efficient* horse power of a locomotive are two very different questions, and the engineer to whom our correspondent refers may have given a correct answer so far as it related to the efficiency of his locomotive. In working out the above question no allowance is made for back pressure, which in locomotives sometimes amounts to one-seventh of the direct pressure. There is also a great difference between the pressure in the boiler and that in the cylinders, especially when running at high speeds and working expansively; this difference of pressure is from 20 to 40 per cent in speeds of from twenty to sixty miles per hour, and is even greater when the cylinders are not protected.

The question, "What is the horse power of a locomotive?" is one of a complex character, and in some respects very different in its nature from that of a stationary steam engine. The efficient horse power of a locomotive may be very small, while its nominal horse power may be very large, and the very best locomotives expend a vast amount of power in proportion to their amount of efficiency. Redtenbacher, a German author of scientific attainments and a practical engineer, has published the results of quite a number of experiments on this head, and his conclusions are that the efficient horse power of a locomotive performing under the best possible conditions, according to his experiments, is only as 230 to 505—not fifty per cent of the power expended. Six wheeled drivers connected together, he found far more efficient than engines having either two or four driver wheels. He also found that the important element, *adhesion*, varied greatly with the character of the engine. Thus a locomotive of eleven tuns weight with two wheel drivers, possessed only 5.5 adhesion, whereas one of twenty-five tuns weight with six wheel drivers possessed 22.5 of adhesion; the former only half the adhesion of its tunnage; the latter nearly the whole of it. There are quite a number of elements which necessarily enter into the computation of "the efficiency of locomotives."—[EDS.

Appreciation of the Scientific American.

The *Iowa Farmer*, published at Des Moines, Iowa, speaking of the SCIENTIFIC AMERICAN, says:—

"This is one of the most valuable publications in the country. To the mechanic and inventor it is invaluable. In it may be found a notice or description, and frequently an engraved illustration, of the most important and useful discoveries of the day in all the arts, both in Europe and the United States. It is highly and deservedly prized by every intelligent workman in the mechanic arts, and receives from them a generous support. It is as necessary and useful to them as any of the tools of their trade, for in its beautifully printed pages they find a record of the result of the toils of years of the greatest minds of the world. A friend who stopped a few days in Chicago on his way West informed us that at a lecture which he attended there one evening, a large portion of the audience were mechanics, and he thinks he saw not less than fifty of them with this paper in their hands reading it, which they no doubt had just received from the Post Office. It gave him an exalted opinion of the intelligence of the workmen of Chicago."

The Egyptian Steamship Voyageur de la Mer.

This fine steamship, built at Boston for the Pasha of Egypt, has been lying idle at her wharf, for several months, in consequence of difficulties connected with the working of her engines. We are informed that a contract has just been closed between the agent of the Pasha and the Corliss Steam Engine Company, of Providence, by which the latter are to remodel her engines by the introduction of Mr. Corliss' improvements. The work will probably be completed in two or three months, and by the 1st of July it may be presumed that this splendid ship (which our readers will probably recollect is constructed with a double hull of iron and wood) will be in a condition to reflect the full credit due to her designers and constructors. She is the largest iron vessel ever built in this country, and is the first, we think, in which an inner casing of wood has been provided in this manner to contribute to the strength and efficiency of the structure.

Fans for Ventilating Mines.

On page 235, this volume, SCIENTIFIC AMERICAN, we published a brief description of the success resulting from the employment of a steam fan in ventilating the coal mine at Abercarn colliery, England. In answer to this, we have received a communication from Stephen Cox, of Bridgeton, N. J., claiming priority of invention, and he has furnished us with some testimony to prove his title. He made a rotary fan, and put it to work in a mine at Reading, Pa., in September, 1854, and another for the same company in November following. Since then, it has been successfully at work, embracing a period of three years and seven months. The mine in which it is placed is three hundred feet deep, and the workings are a considerable distance from the shaft. The fan is three feet in diameter, has four blades, and runs at the rate of twelve hundred revolutions per minute. A branch pipe from each inlet of the fan case connects with a main pipe, which is carried down the shaft and into the rooms where the miners are working. Through this pipe the foul air is sucked up, thus causing a current of fresh air to rush down the shaft and through the mine to supply the place of that which is exhausted. This fan is driven by the usual mine engine, and is not set in a separate ventilating shaft like the one in England. As it appears to be competent to fulfill the offices for which it was constructed and arranged, it is an important fact for miners, inasmuch as it presents a very simple method of mine ventilation. In regard to its utility, Thomas Robarts, mine agent for Reeves, Buck & Co., of Phœnixville, Pa., states that the mine to which it has been applied, was previously almost impossible to work on account of foul air, but this was removed within an hour after the fan was set in motion, and the mine thoroughly ventilated. This is pretty high testimony to its efficiency. "Honor to whom honor is due."

Recent Patented Improvements.

The following inventions have been patented this week, as will be found by referring to our List of Claims:—

COMPRESSING AIR.—Samuel Chichester, of Poughkeepsie, N. Y., has invented a machine, the object of which is to obtain from a spring or other prime mover exerting an unmoving or but little varying force, a supply of air for any purpose at a pressure above that of the atmosphere that shall be perfectly uniform, notwithstanding any degree of variation in the quantity used. The machine is especially intended for supplying the necessary quantity of air for passing through and taking up the vapors from the hydro-carbon liquids for illuminating purposes, particularly the liquid invented by Levi L. Hill, and it consists in a combination of a spring with a reservoir and pistons.

MACHINE FOR CUTTING CORK.—The great difficulty in cork-cutting machines has been in keeping the cutters sharp, and at the same time not interfering with the operation of the machine. In this machine this difficulty is overcome, for the cutters and saw teeth are kept sharp by an automatic or self-acting sharpener. The cork is fed to the machine, and cut, and the shaving is conveyed away by the saw teeth, and the necessary parts sharpened by the rotation of a wheel or handle. Edward Conroy, of Boston, Mass., is the inventor.

MODE OF COOLING MEAL.—This invention consists in the peculiar arrangement of a suction fan, conveyors, and elevators, so that the meal during its passage from the grinding stones to the bolts, is thereby cooled and dried within a limited space, the whole being a simple and economical device. It is the invention of John Deuchfield, of Oswego, N. Y.

DRIVING WHEELS FOR LOCOMOTIVES, PLOWS, &c.—John F. Elliott, of New Haven, Conn., has invented a novel arrangement of legs and feet applied to the driving wheels of locomotives for running upon common roads or for agricultural purposes, such as plowing and otherwise tilling land, or reaping and mowing by steam power, and operated by a cam, or its equivalents, to cause the propulsion of the machine or engine by the rotary motion of the wheels.

PORTABLE CHAIR LOUNGE AND BEDSTEAD.—This invention contains in one simple article the above useful comforts. It consists in a sort of chair frame, so arranged that by shifting a couple of straps it may be converted into an easy chair, or if desirable into a sort of sofa lounge; or, by another change of the straps, it may be horizontally extended into a comfortable bed. The legs are hinged, and the whole folds up into a small pack. To take up one's bed and walk, with this contrivance, would be a very easy matter. We have had one of these chairs in practical use for some time past, and therefore speak from experience when we say that it is an excellent improvement. For camp use it is just the thing, and our government ought to give it a trial among the soldiers. The inventor is Z. C. Favor. The assignees of the patent, who may be addressed for further information, are Messrs. Brown & Hilliard, Chicago, Ill.

The following inventions were patented last week:—

CARRIAGE WHEEL.—With this arrangement, after the spokes are inserted and the wheel put together, the wheel can be tightened by simply inserting the taper axle-box, expanding an annular packing ring which is placed within the eye of the hub, and causing the same to bear against the ends of the spokes, and force them outward until the wheel is tightened up; and again, in case of shrinkage, after the wheel has been in use, by simply withdrawing the taper box and inserting a duplicate packing ring and again driving in the taper axle box, all the spokes can be moved radially outward, and the wheel thereby tightened up. We regard this as a good attachment to wheels. It is the invention of B. A. Rogers, of Shubuta, Clark county, Miss.

COAL HOISTER.—With this machine, the coal car loaded can be hoisted from the railway of the mine or pit, to a convenient or proper position relatively to a dumping shute, and then automatically dumped and allowed to re-adjust itself and descend to its original position ready for receiving another load, without any other attention other than the turning of a windlass shaft to the right and left. It is the invention of George Martz, of Pottsville, Penn.

FILTER.—This invention is designed for purifying the water used in steam boilers, and thus prevent incrustations of lime and sediment over the inner surface of the same. The arrangement adopted is very simple and perfectly automatic in its operation, the weight of the discharging filtered water being made available at intervals for opening certain valves, so as to effect the discharge of all sediment which may have accumulated in the bottom of the filtering vessel. It is the invention of Dr. A. Jaminet, of St. Louis, Mo.

New Inventions.

Ericsson's Hot Air Engine.

It is now twenty-five years since Capt. Ericsson was first introduced to the public as an inventor and improver of the hot air engine, and if ever an inventor deserved success, he certainly does. The resolute perseverance and ingenuity which he has displayed have at last led to the production of an engine which does him a great amount of credit. It is represented in the accompanying engravings, of which Fig. 1 is a perspective view of the entire engine. Fig. 2 is an enlarged longitudinal view of the "supply piston." Fig. 3 is a plan view of the cap of this piston, and Fig. 4 is a plan view of the outer face of the "working piston." There is a great amount of originality displayed in the mechanical details, and in the principles of operation embraced in this caloric air motor; it is in many respects different from all others which have preceded it, and deserves very general attention.

The engraving represents a horizontal single acting engine with one cylinder, the latter fulfills the offices of feed pump, prime mover, heater, and air chamber. Any number of such cylinders may be yoked to one shaft, but this one is complete in itself. Though single-acting and horizontal, it communicates a very equable motion to a main revolving shaft—a result very difficult to accomplish.

The cylinder, A, is prolonged and has its back end (which forms its air heater) inclosed in the furnace, B. There are two pistons in the cylinder, the outer one, C, is called the "working piston," and also forms a movable cylinder head. It has a spring valve, D, Fig. 4, in it for admitting cold feed air into the cylinder at each return stroke. The "supply piston," E, Fig. 2, is elongated and has a curved end next the heater—the end of the cylinder is also of the same form to allow for expansion and contraction of the metal. The rod, P, of this piston works through a stuffing box in the piston, C, Fig. 1, and is connected to one end of the angular lever, F, which vibrates on the pin, g; the other end of this lever is attached to the crank on the main shaft, G. The cap, f, of the piston, E, has an opening at its rim, and a circular recess behind it. In this recess there is a ring, e, which slides back and forth on stud pins. This ring closes the opening in the cap when the hot air pressure is operating the piston; when it exhausts at the end of a stroke, the cold air by atmospheric pressure rushes in to supply the partial vacuum, pushing open the spring valve, D, and the ring, e, thence passing through the recess and down between the piston, E, and the cylinder, to be heated for the next stroke. In this manner the cold air is fed in. When the expansive pressure of the hot air has moved the piston to the end of a stroke, at that instant the oscillating rod, H, attached to the main shaft opens the exhaust valve, I, on the back end of the cylinder. By the peculiar combination and arrangement of the angular levers with the two pistons, C and E, and their rocking shafts and the cranks on the main shaft, the supply piston, E, moves back, following the exhaust with a speed three times greater than that of the working piston, C, so that there is always a space between the two that is filled with air, which forms an elastic cool cushion between the pistons, C E. These move with variable speeds back, but nearly uniform forward. As the air is flowing in through the valve, D, by atmospheric pressure, whenever the back pressure exceeds this, the valve closes itself. The piston, C, has two guide rods moving through eyes, a a, in standards. There is also a vibrating angle lever, J, attached to this piston at each side of the guide rods; they are connected to a rocker shaft at the foot, and an oscillating lever, L, connected with a crank pin, K, on shaft, G. These mechanical devices and their peculiar arrangement cause the variable motions of the supply and working pistons described. And although they are represented connected to two crank pins on the main shaft, G, Capt. Ericsson has in some of these engines united them to one crank pin, and produced the same variety of motion.

Every mechanic will at once notice the novel mechanical arrangement of the angle levers with the pistons and main crank pins. The form of the piston, E, prevents it from being readily injured by a high heat, and as there is an air recess between the two pistons, the working one, C, is kept perfectly cool.

It may be supposed by some persons that pressure has been carried in these engines without injury to any of the parts, by a high temperature.

In regard to a variable increase of power, this has not the flexibility of the steam engine. Thus a non-condensing steam engine, if its boiler is sufficiently large and strong, can be worked at from thirty to one hundred pounds pressure, with a triple increase of power from the lowest to the highest pressure. This flexibility is very necessary and convenient in some factories where there are several machines that have to be stopped at intervals of some days, while others are kept running. But for constant small portable engines, capable of being applied to a great number of useful purposes, such as pumping water, driving portable grain mills, &c., this caloric engine appears to be a safe, economical, and convenient engine. Any boy or laborer who has sense enough to kindle and take care of a fire can take care of it; the fire has but to be kindled and in about from ten to fifteen minutes it will be ready to run. If left to itself it will stop when the fire goes down, and neglect cannot cause an explosion, because a charge of air has to be heated for each stroke.

It will be noticed by many of our constant readers that this caloric engine differs from all its predecessors. On page 153, Vol. 8, Scientific American, there is an engraving of Capt. Ericsson's hot air engine patented in 1833; on the succeeding page, 154, a figure of the one patented in 1850, and on page 180, Vol. 11, an illustration of the one patented in 1855. In all these a *regenerator* to take up the caloric of the exhaust air was employed, while in the above illustrated engine there is no regenerator; it exhausts direct—like a non-condensing steam engine—into the atmosphere. In reference to this mode of employing hot air, we said on page 181, Vol. 11, Scientific American, "The best way to use hot air as a motive agent appears to be to work it expansively as far as this can be done, then exhaust into the atmosphere." This idea is carried out in this engine, it is therefore rendered more simple, more efficient, and it costs much less to manufacture. In former hot air engines it was impossible to prevent the valves from leaking; this difficulty seems to be overcome in this one, as it has been running for several months without requiring any repairs or alterations; this is a very important point. One of these engines is now employed by the Metropolitan Bank of this city, for purifying water, and we have been informed it gives a high degree of satisfaction.

ERICSSON'S IMPROVED HOT AIR ENGINE.

Fig. 1

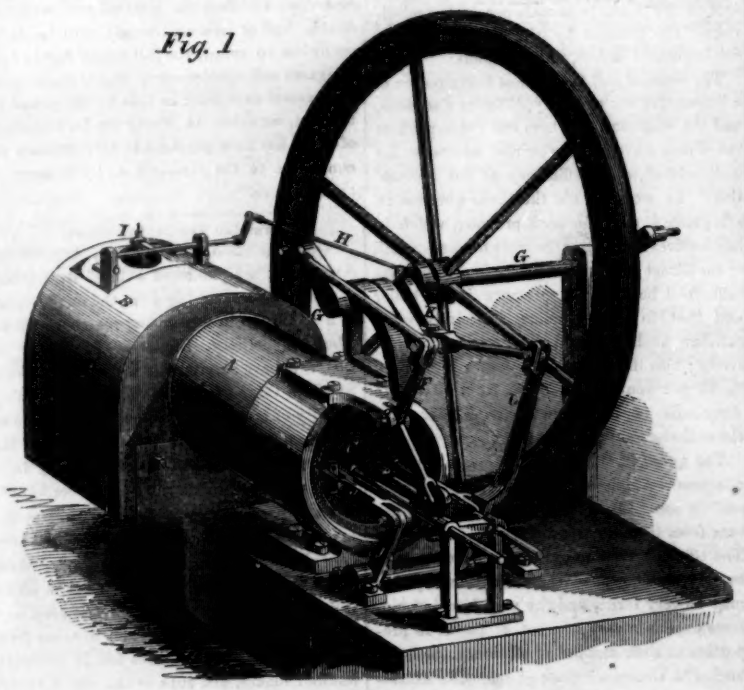


Fig. 2

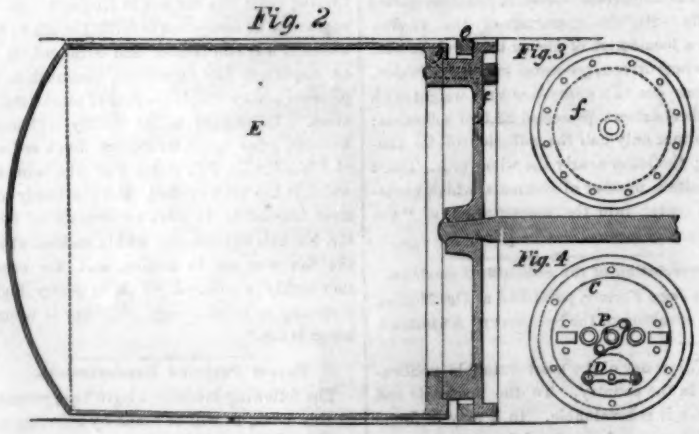


Fig. 3

Fig. 4

The Power of Locomotives.

The old fashion of rating steam engines as of a certain nominal horse power depending on the size of the cylinders alone, was established at a time when the pressure of the steam was almost uniformly low, and never conveyed a very definite idea of the actual work performed even under those circumstances. Of late it has become common to include in the estimate of power all the conditions affecting the engine, such as the speed with which it works, the pressure of the steam in the boiler, the expansion in the cylinder, etc. This is *actual* horse power, and can be reckoned very closely by the employment of suitable apparatus in any given case. In some experiments lately made on the New York and Erie Railroad, it was found that a common broad-gauge locomotive in good order could pull with a force of about 14,000 lbs. on the couplings connecting it with the cars, and could continue to pull steadily with that amount of strain until the speed reached about 15 miles per hour. Above that velocity the ability to pull gradually diminishes, until at somewhere from 40 to 80 miles per hour the machine becomes able only to move itself without any train. Mr. Henry Waterman, of this city, who is conducting a series of experiments on this and kindred points, employing better apparatus and expending more care than in any previously made, finds that the greatest mechanical effect of an ordinary locomotive is at about the speed of 15 miles per hour, and in one case, at least, has actually found the boiler to continue to generate steam in sufficient quantities to maintain the pressure while the locomotive was moving at that speed, and pulling with an average strain or force of a little more than the amount above stated. This makes the actual power of that locomotive 560 horse power, without including the power necessary to overcome the resistance to its own motion. This will, we feel positive, be considered an extraordinary result even by those most familiar with the subject. It should also be remarked that the amount of adhesion is, in this instance, considerably greater than is given by the results of the older experiments on a smaller scale. The adhesion, or the resistance to the slipping of the wrought iron tires upon the wrought iron rails, was in these instances more than one-third of the weight upon the driving wheels. It is needless to say that the rails were in these trials perfectly dry, but no sand was applied to increase the adhesion.

New York, April 14, 1858. T. D. S.

Decision of the Supreme Court.

McCormick vs. Manny & Co.—In December, 1854, C. H. McCormick brought a suit in the Circuit Court of the United States for the Northern District of Illinois, against John H. Manny and his partners, charging that they were building Reaping Machines that infringed his patent of 1845 for the divider and the reel post, and his patent of 1847 for the raker's-seat and reel. The case was elaborately argued before the Circuit Court in September, 1850, and in January, 1857. Judge McLean delivered the opinion of the Court, deciding that Manny & Co.'s machine did not infringe on McCormick's patents as charged, but, on the contrary, was an improvement invented and patented by John A. Manny, upon reaping machines which existed prior to McCormick's.

From this decision McCormick appealed to the Supreme Court, and this final appellate tribunal rendered judgment on the 22d instant, affirming Judge McLean's decision and dismissing McCormick's bill with costs. The case was argued for Manny & Co. by E. M. Stanton and George Harding, and for McCormick by E. N. Dickerson.

A synopsis of the decision will be given next week.

At the opening of a new street in Paris lately, M. Dubosc's electric light was employed with great success, perfectly illuminating the street, and shedding a beam of brilliant white for a great distance.

Scientific American.

NEW YORK, MAY 1, 1858.

More Favors Wanted from Congress by Patentees.

We notice among the recent proceedings in Congress that Bancroft Woodcock, of Wheeling, Va,, and J. A. & H. A. Pitts, of Buffalo, N. Y., have presented petitions to the Senate for the extension of their patents. Mr. Woodcock has had several patents for improved plows, one of which was extended in 1851, and will therefore expire this year, and we presume this is the one upon which he is seeking to obtain additional protection by a special act of Congress. The Messrs. Pitts are patentees of a machine for threshing and cleansing grain, which is well known to the public, and there is not much doubt that it has richly remunerated its inventors. This patent was originally granted June 29, 1837, and was extended by the Commissioner for a period of seven years beyond its original date. It will therefore expire on the 29th of June next. These petitions were referred to Senator Trumbull, of Illinois; and in each case he has submitted adverse reports, which were concurred in.

To say that we are gratified at the result would be only reiterating sentiments well known to our readers. We hope it is but an augury of the intention of the Committee in relation to other cases which are now before them. There is much more real merit in these cases than in Colt's; and it would redound more to the honor of Congress to extend them than to tolerate the demands of the rich monopolist of revolving fire-arms, whose claim to Congressional protection has scarcely a shade of merit to recommend it.

Since the above was put in type, we learn that the Committee on Patents of the House of Representatives have reported strongly against the extension of Colt's patent, notwithstanding the tremendous pressure that has been brought to bear. The same committee have also reported against an extension of the patent of Sickles' cut-off. It is supposed that the large number of similar cases before the committee will share the same fate.

The Senate Committee on Patents met on the 26th instant, to decide on the india-rubber cases of Hayward & Chaffee, and in our next issue we will endeavor to give their decision and an abstract of its grounds.

Paying Out the Atlantic Telegraph Cable.

By the latest news from Europe, we learn that very active preparations are now making for the next effort in laying the Atlantic telegraph cable. Our noble frigate, the *Niagara*, with the British war steamer *Agamemnon*, her former companion, are taking in their shares of the cable, and they will be in readiness to proceed on the expedition about the end of May. Great care has been taken in the construction of the paying-out machinery, and after it is all completed, the most intelligent machinists in England are to be invited to inspect it and offer critical observations. When no good cause can be shown for further alterations in the machinery, both vessels will proceed to sea, and rehearse a series of experiments in paying out and hauling in the cable, then return to England and report the results. Should these be satisfactory, the final expedition will sail soon afterwards. Instead of commencing to lay down the cable on the Irish coast, as formerly, they will sail out to mid-ocean, divide, and commence paying out from the two vessels at once—stern to stern—the one steaming for England, and the other for Newfoundland.

The principal directors in the last expedition are to occupy the same positions in the next. Mr. Bright is still chief engineer, and from his former experience it is reasonable to suppose he will neglect no precaution to ensure success. A great number of patents have recently been taken out in England for machines to pay out the cable. The directors of the Telegraph Company have quite a variety of such to select from, and we hope they will choose the best. They seem to have confidence in the entire success of this second attempt, as they have employed a staff of operative telegraphers to practice on the coils to perfect themselves, and be in readiness for immediate action as soon as the cable is laid.

If any impediment should stand in the way of success in this fresh attempt, it will not be caused by a want of attention to the several parts of the work, for each will have to pass through a most rigid ordeal of experiment, under the immediate inspection of the most distinguished scientific men of the world.

From recent experiments on the coils, as stated in English papers, it would appear that only about eight words per minute can be sent through the cable—very slow work indeed—but such as seems to accord with the deductions published on page 184 of the last volume of the SCIENTIFIC AMERICAN.

About fifty-two miles of the lost cable—some of which lay one thousand fathoms deep—have been fished up. It was in as perfect a state as when first laid down, as regards its electrical conditions, but showed signs of the outer covering of the spiral wires having stretched considerably.

Outdoor Exercise and Recreation.

Some few weeks since, the London *Times* published an article on the relative degrees of health and longevity of the people of Great Britain and of the United States, in which the superiority of the former country in both respects was broadly asserted. The writer attributed the dwindling of the American race, as he was pleased to term it, to the endemical diseases of yellow and other fevers with which portions of our country are unhappily afflicted, and to the impropriety in the manner of living. To the latter more than to the former cause is owing, we think, the results mentioned. The errors in this respect commence with the child. Instead of giving it such an education as will produce a full physical development by constant outdoor exercise, it is confined in a close nursery and subjected to a mode of treatment precisely opposite to the proper one. The frame is at the outset made weak and puny; and habits are engendered and diseases contracted which cling to it during the time when verging towards what should be a maturity of strength and beauty, which it never reaches. And thus in the very morning of life, when the sensations have the untiring activity which novelty begets, the mind is, through a lack of vigor and development of the body, filled with languor, dejection and despair, and diverted from its most noble and devoted aspirations.

There is but one method of establishing and preserving the good health and physical development of a people, and that is, a proper degree of healthy exercise and recreation, both before and after the period of intellectual maturity. Infants should be upon all suitable occasions carried into gardens and other open spaces of country, where they can breathe fresh air, and as soon as they are able to walk, and at a later period, should be allowed to walk, romp, and indulge in the various delightful amusements which the impulses of ingenious youth dictate. The unhealthy restraints in dress which foolish fashion has imposed should be abolished, in order that the lungs and less delicate organizations of the system should have full play to perform their functions, and expand to their greatest natural development. With the advance of the more vigorous and aspiring efforts of intellect, athletic games and employment of a more manly and corresponding character should be freely indulged in, having in view the increased physical strength and more mature judgment. These exercises should take place daily, and as much as possible in the open air, and walking at different periods of the day should constitute one of their most important features. And, finally, when the delightful visions of youth give place to the cold, cautious and calculating ideas of the experienced, this bodily exercise should be daily continued, and with the hours set apart for it should be also allotted hours for intellectual and other recreations, which shall unbend the mind from the cares and vicissitudes of business and household duties, and give it a corresponding vivacious and healthy exercise with the body.

George Stephenson.

When the very paper you are now perusing, gentle reader, has traveled tens or hundreds of miles upon the iron road drawn by the locomotive engine at the rate of thirty miles an hour, without creating one emotion of surprise, or exciting in you an exclamation of astonishment, you can scarcely be expected to believe that thirty years ago, the man whose name heads this article was called a fool, a madman, and a dreamer, because he undertook to make a locomotive travel ten! Yet such was the case, and all the facilities of land locomotion that we now possess, all the good that railways as social revolutionizers have done, the increase of commerce, and the strengthening of friendly relations between city and city, State and State, that iron roads have effected, we owe to the indomitable courage, heroism, perseverance, and energy of the self-taught, self-made George Stephenson. Not only this, but to him are we also indebted for the "Geordy" safety lamp, for the invention of which he has had the heartfelt blessing of many a poor miner who had nothing else to give. Let us know the history of this man's struggles, said the world, let us know the secret of his success, and give us an opportunity to compare him with the mighty dead whose lives are to us as household words. This has been done. We have before us the "Life of George Stephenson, Railway Engineer," by Samuel Smiles, published by Ticknor & Fields, Boston; a modest, unpretending volume, just in fact what it should be, quiet and strong. Of the work of the biographer, we cannot say too much. There is not one page of dry reading in the book, from the moment you take it in hand to the close. You are engrossed, absorbed; it is a story, not a life, full of incidents, each pregnant with results that have changed the aspect of the world. The reader follows, as through an enchanted grove, the career of this noble man. It is a book that should be on every shelf, and children should have it read to them that they may learn lessons of self-reliance. For the personal gratification that the author has afforded us, we are grateful, and we know that each reader will be laid under the same debt. Heartily do we wish the book success, sincerely can we recommend it to all, for it is a worthy monument to a great man, to a high priest of the nineteenth century civilization, George Stephenson!

Horse Taming.

In the course of the past week we have received not a few communications on this subject, some from amateurs and some from persons calling themselves professional horse-tamers, but all *deny* the use of any drugs, and one correspondent, who says that he acquired his art from the original Rarey, informs us that he adopts no such means. That Mr. Rarey has tamed vicious horses, we are bound to believe; that the temper of any animal may be subdued by kindness we know by personal experience; but that the majority of the persons who are now perambulating the country, taming anything, from horses to black beetles, are humbugs, we are convinced, and we should strongly advise no one to purchase their pretended secrets, but wait and see the effect of time on the animals they have treated.

In the meantime, as a taming mania seems to be pervading the whole of our rural districts, we will give a receipt that can be safely practiced until we are able from authentic sources to publish what is at present the great secret. Be kind to every animal in your possession, or that may come across you in the day, use less whip and more persuasion, backed by a little choice feed, keep the animals lodgings clean and sweet, and pay attention to its body; take in fact the greatest care of your cattle or horses, become fond of them individually, and they will become fond of you; in a word, treat all animals with the attention and respect they deserve, as fellow laborers, and, our word for it, you will never regret the trouble.

The French Military Force in the Crimea.

M. Vaillant, the French Minister of War has given details of the supplies of men and *materiel* that were sent to the Crimea during the war with Russia. The whole force sent by France to the Black Sea was 309,268 soldiers and 41,974 horses; of the former 70,000 were killed or died in the hospitals, or were otherwise missing. It is considered that 93,000 were wounded and survived. Of the horses only 9,000 returned to France. The great guns, howitzers, &c,, were 644, besides 603 furnished by the navy. The light artillery for field service furnished 500 guns more, and in all there were 4,800 wheel vehicles for cannon sent from France. The missiles of death, too, were fearfully vast; 2,000,000 of shells and cannon balls, 10,000,000 pounds of gunpowder, and 66,000,000 of ball cartridges. One hundred batteries and fifty miles of trench were constructed, besides ten miles of defensive works, and five miles of subterranean galleries in the solid rock.

The food sent from France, besides items of smaller quantities, was 30,000,000 pounds of biscuit; 96,000,000 of flour, equal to 450,000 barrels; 7,000,000 pounds of preserved beef; 14,000,000 pounds of salt beef and lard; 8,000,000 pounds of rice; 4,500,000 pounds of coffee; 6,000,000 pounds of sugar; 10,000 head live cattle; 2,500,000 gallons of wine, and nearly 1,000,000 pounds of Chollet's preserved vegetables were among the larger items of supplies. The horse feed, too, was immense: 170,000,000 pounds (equal to 85,000 tuns) of hay; 180,000,000 pounds (90,000 tuns) of oats and barley; 20,000 tuns wood; 20,000 tuns coal, charcoal and coke. There were 150 ovens to bake bread, and 140 presses to press hay. The clothing was another branch of large supply, comprising garments in such hundreds of thousands that it would be tedious to enumerate them; but as some clue to the matter, the number ranged from 250,000 to 350,000 of each article of clothing. For the piercing cold of the Crimea there were 15,000 sheepskin paletots, 250,000 sheepskin gaiters, and tents for 250,000 men. The harness and farriery departments present an immense quantity of supplies, among them were 800,000 horse shoes, and 6,000,000 horse shoe nails.

In nothing do the French excel as in their hospital arrangements. They sent 27,000 bedsteads for invalids, as many mattresses, and 40,000 coverlets. There was the material for ambulances for 24,000 sick men, and 600 cases of instruments, and 700,000 pounds (350 tuns) of lint, bandages and dressings of various kinds. Then for the sick there were the most liberal supplies for their sustenance, such as concentrated milk, essence of bouillon, granulated gluten, &c. The money expended at the seat of war was $56,000,000. Marshal Valliant also tells of the vast maritime preparations for conveying the army and its supplies over the sea. Among the vessels employed between France and the Crimea, though not stated in the report, were 40,000 tuns of American shipping, embracing some of the finest and largest clipper vessels, as well as some steamers of the American mercantile marine, and for whose services a liberal compensation was made. Taking the totality of all the voyages made by all the men, horses and material, there were conveyed by the French government during the two and a half years of the war, 550,000 men, 50,000 horses and 720,000 tuns of material.

Some beautiful photographs of the moon have lately been taken in Europe, through a large telescope, and on them the mountains hills, and valleys of our satellite are perfectly portrayed.

[For the Scientific American.]

Wood Bending.

The use of bent wood for an increasing variety of purposes surpasses the knowledge even of those most familiar with its production. It is used in all departments of business and pursuits of life, wherever man and his products are known. It is as ancient as history, and is found among those in the rudest state of barbarianism. Little is known of the most ancient devices for bending wood, but the oldest patented in England is now nearly a century old, and is used there yet for some purposes. The oldest in the United States was used first in 1794 up to 1821, then patented with but little change. In 1813, at the Woolwich Navy Yard, in England, floor timbers, sixteen inches square, for a man-of-war, were bent over an arc of a circle with a radius of four feet. All these devices, as well as almost all others subsequently used, restrained, in some degree, that tendency found in wood to elongate its outer curve when under the operation of bending, the same as is now claimed to be done in apparatus brought as near the state of perfection as the nature of wood and the change of position the particles undergo will admit. The organic structure of all woods of the endogenous or internal growths, and the exogenous or external growths, are similar, and possess the qualities of cohesiveness and compressibility more or less, differing most in the degree or quantity of these two qualities, which make and determine the amount or degree of flexibility and elasticity in any wood. These qualities, with a structure that will admit any fluid agency to thoroughly penetrate and soften its particles, indicate a wood that may be made to assume any curvilinear shape required for practical use. Then only ordinary judgment and skill would be required to operate good wood-bending apparatus successfully, without any loss occuring from breakage of the wood under the operation of bending, but when the wood has not been seasoned or partially seasoned, a trifling loss will occur from breakage caused by the shrinkage that all woods are subject to in the process of seasoning. And in the case of unseasoned bent wood, this shrinkage acts upon the fiber of the outer curve, which is always at the point of tension, if not in an actual state of severe tension, for the reason that in deflecting any substance, but particularly wood, either with or without partial restraint, to oppose tension, the wood is acted upon by two forces, the one a crushing force that fore-shortens and upsets the lesser or inner curve, with a tendency to rupture it laterally, the other a tensile force that stretches and elongates the greater or outer curve, with a tendency to fracture it transversely and lift the fiber, which is the most hurtful and oftener occurs to the product. These two forces are divided by a neutral line more or less removed from either curve in proportion to the amount of restraint employed to oppose the elongation of the outer curve, but when nearest the outer curve the best product is had, because all tension, however little, is injurious to the structure of the wood, arising from separating and drawing out the fiber which can never be made to unite again, as in ductile and malleable substances, and because the crushing or compressing force improves the wood by forcing the fiber into the interstices or cells, and by interlacing and interlocking the fiber, a product is had nearly resembling the knot or knurl, which is difficult to split or cut, even when rupture is indicated.

In order to get the best product of bent wood, the crushing force alone should be used, and it can be if the fiber of the wood be left free to move into the new position in more than one direction from the point of bending, by beginning the curve in the middle of it when the wood is made to assume a long curve first, before taking the shorter curve of the mold, which long curvature starts the fiber throughout the whole wood, and makes more, if not every particle of the wood, accessible to the influence of the softening agent already in it, and consequently more yielding to the action of the crushing force. This force should be produced and governed by fixed and immovable restraint that should not compress the wood while in its straight form; it should also prevent end expansion and preserve the exact length on the outer curve of the product as that of the wood in its straight condition. This would give a product uniform in density and rigidity throughout its whole length, with the fiber undisturbed on the outer curve, to resist any tendency to change the shape produced. The long curve gradually lessening to the curve of the mold, would amount to double on successive manipulation, and by successive manipulation wood has been compressed into one-third of its primary bulk, with every quality improved to resist decay and wear in use. Nothing can be reasonably urged in support of the popular belief of the necessity to produce or permit tension and elongation in successful wood bending. Tension and elongation are required or permitted only in consequence of the use of imperfect apparatus—elongation is positively indispensible in machines that bend from one end, or in one direction from the point of bending, and that press the wood against the mold with such power as to prevent all movement of the fiber, producing in advance of the point of bending, a wave-like movement among the fibers of the wood, held rigidly confined and straight, until suddenly made to take the curve of the mold. The movement in advance of the bending gradually accumulates a power that resists compression thus attempted, and before the completion of the process, and in order to save the machine or the product, relaxation of restraint is required, and is followed by elongation of the wood, however small it may be. Tension acts upon the fiber, giving a product uneven throughout its whole length, and more liable to change the artificial shape. It is obvious that any augmentation or diminution of restraint during the process, must give just such results, and that the machinery in use for wood bending is far from having reached perfection; there can and will be machinery constructed to bend large timbers for marine and other structures over any arc or curve that will not require a reduction of its bulk, by the compression of the inner curve, to less than one-half its original bulk. All our past experience has shown wood-bending machinery to be most profitably employed in the production of smaller articles, for which there is an unlimited demand that will continue because of the suitableness and superiority of bent wood for these purposes.

J. C. Morris.

Cincinnati, April, 1858.

Heat of the Approaching Summer.

A report was recently circulated throughout Ireland that Lord Rosse, the celebrated astronomer, had predicted an exceedingly hot summer, and that farmers should prepare for it by putting up sheds to protect their cattle from the scorching beams of *old Sol*. Upon such public rumors connected with the name of so great a man, it is reported that numbers of the Irish farmers were taking measures to erect large cattle sheds in anticipation of a more than tropical summer. To arrest such foolish preparations, Lord Rosse has published a letter, in which he states that he never expressed any opinion about the heat of the season. This affair reminds us of the comet hoax which was so extensively circulated during the early part of last year.

Wine from Missouri.

The *St. Louis News* informs us that eight thousand gallons of Catawba, from the vineyards at Hermann, Mo., lately arrived in St. Louis on its way to Mr. Longworth, of Cincinnati, to be manufactured into sparkling wine. The price paid at the vinyard was $1,25 per gallon. One grower, M. Poeschel, has realized over five hundred dollars per acre from his vinyard at that place; so it would seem that wine-growing in Missouri is a profitable as well as pleasant occupation.

Can there be a Great Scarcity of Timber in the United States?

ARTICLE I.

Messrs. Editors—Taking, as a citizen, a deep interest in the welfare of the present and future inhabitants of this great commonwealth, I embrace with much pleasure the opportunity of bringing before the readers of your valuable paper, the views of a professional German forester—Charles Bertholdi—on a most important branch of national economy, namely, the culture of trees. Mr. B. recently traveled through the United States, and he treats his subject without any prejudice. He believes that if the present reckless destruction of timber is continued for a number of years longer, the United States will have to bear the disastrous consequences of that destruction. The bases of his conclusions are stubborn facts taken from the history of ancient and modern nations, such as the Persians, Greeks, Romans and Germans. He considers Persia to be one of the most remarkable illustrations of his views, and he says that there are in this respect three periods to be compared. The first is the time anterior to Persia's flourishing as a great empire, when ignorance and recklessness were dominant for the immense destruction of forests and woods; the second period is the time of its prosperity and greatness, when no difficulties were considered great enough to obstruct an extensive cultivation of trees; and the third period—which extends down to the present time—is that of relaxation in efforts to cultivate and preserve timber. During the middle period, even on the very verges of vast deserts where no rivers or brooks existed, every available source of water was used to supply aqueducts for producing the humidity necessary to the growth of trees. The contrast of desolate deserts and timber land impressed the Persians with a natural love for the cultivation of timber. Religious and political law-makers were so wise as to impose on the people a sacred duty of planting and of promoting the plantations of trees, and its fulfillment was shown to be the only way to be blessed in this and in the world to come. Kings and vice kings, or satraps, early in their infancy, were taught this duty. Thus we understand why every wealthy Persian applied his riches to the transformation of barren land into gardens and groves of fruit trees; and Persia, in the time of its might and power, was covered with gardens, woods, parks, and groves, and thereby the Vandalic destructions of former time disappeared. This love of the Persians for woods accompanied them to other countries in their strife for conquest, and when their dominions extended to the Black and Mediterranean Seas, the same laws for the cultivation of trees were maintained. Generally, the Persian kings appointed wood overseers in their new provinces. The Israelites had to petition their conqueror Artaxerxes, the Persian king, for an order commanding the royal overseers of woods to allow them (the Israelites) to take timber from Mount Lebanon, to be used in the construction of their temple at Jerusalem, an account of which is given in the Bible. (Nehemiah, chap. 2.) As many cold parts of Persia were densely populated, there was a large annual consumption of timber.

In Greece there were provinces which were covered with woods, such as the mountainous regions of Tiber, Boetia, and Thessalonia. But in the province of Attica, with an extent of only forty square miles, and a number of inhabitants amounting to half a million, the people had to plant their trees so as to provide for ship and house-building, and even for their mines. Under government care was placed the cultivation of the fig and olive trees, devoted respectively to their deities, Ceres and Mercury. In Greece, too, religious influence was exerted to keep sacred the temple groves, in which only the decayed trees were allowed to be cut down. The only State forest being at a great distance from the city, trees were planted on the adjacent mountains. Almost every village had its woods, which were under the supervision of the government.

Under the rule of the Romans, the stringent laws for the cultivation and preservation of trees much resembled those of Greece, even to the extent of consecrating the groves surrounding their temples. Each farm was generally fenced with woods, which, together with the beautiful fruit and other trees in the gardens within the farms, imparted much beauty to the country residences.

As to Germany, the country was covered with dense forests a long time before the great nations mentioned disappeared from the scene of action; gigantic trees were found in these forests. Already in the seventh century of the Christian era, the increase of population and its need of agricultural productions caused the clearing of forests. But this clearance did not assume so large proportions as might be supposed, as rigid laws were in force to properly limitate the natural instinct of the peasantry for the destruction of woods. In the course of time, however, this regulation became perfectly tyrannical; large forests being in possession of individuals—kings, nobles, and clergy. The first French revolution checked despotism in this direction; but on the other hand, the destruction of forests became at this period so prevailing, that a perfect barrenness of the soil was created in some parts of Germany; and it took many years of hard labor and the expenditure of much money to restore the fertility of these barren mountains, which restoration was also owing to the development of a better and more enlightened public spirit, which counteracted the effect of vile passions and ignorance. At present, in all parts of Germany, laws and regulations for the cultivation of timber are enforced, which laws are unsurpassed in respect of having yielded the greatest possible quantity of wood, and at the same time provided for a most extensive growth in the future.

L. R. Breisach.

Literary Notices.

A Treatise upon the Sale and Management of Patents, etc.—We have received a book bearing this title, having neither the author's or publisher's name attached, but we presume it is the one advertised by Cornwall Brothers, of Hartford, Conn. At any rate it is full of varied and valuable information, and as to what it says upon the subject of its title we see nothing that is not consonant with common sense, and the advice which it gives to inventors is very good. There are some short biographies of eminent inventors at the end of the volume which serve to relieve the business portions of the work.

Life Thoughts.—Messrs. Phillips, Sampson & Co., of Boston, have sent us a volume, through Messrs. Rudd & Carlton, of New York, bearing the above title. It is made up of brief off-hand ideas and illustrations thrown off by Henry Ward Beecher in the course of his ministry for two years past. They were taken down by a lady in his congregation—Miss Proctor—and are original, acute and oft times exceedingly happy illustrations of great Christian truths. Mr. Beecher is undoubtedly a man of genius, and has an original way of speaking his mind. He is known as a radical thinker and his views are generally well understood. The "Life Thoughts" bear mainly upon the Christian religion.

Practical Mechanics' Journal. Wiley & Halsted, 351 Broadway.—We have received the January, February and March numbers of this useful publication, and perused much of their contents with great interest and satisfaction. They contain descriptions and illustrations of recent patented and other inventions, contributions from able correspondents, and proceedings of scientific societies, in all of which is embraced such matter as cannot fail to be interesting and instructive to the general reader.

Adele. By Julia Kavanagh. D. Appleton & Co., New York.—The authoress of this pleasing work of fiction is a great and powerful delineator of female character, and she shows her power and truthful appreciation of the motives that govern human action in a marked manner. It is, if not her best book, at least equal to anything she has written, and that is no small praise for it. The story is pretty, the plot interesting, and the whole is well told. No one will waste their time by reading such a book as this in their idle hours.

Art of House Painting.—This is the title of a very practical little work by S. N. Dodge, No. 189 Chatham street, this city. It contains very useful information relating to the mixing and application of paints, also instructions in graining, to imitate various woods. Opinions arrived at from thirty years observations in painting are given by Mr. Dodge, and his experience seems to bear out the conclusions derived from the experiments of Mr. Ewen, described on page 187, this Vol., Scientific American.

Littell's Living Age. Littell, Son & Co., Boston; Stanford & Delisser, 637 Broadway, New York.—This well known periodical has just commenced an enlarged series, each number containing eighty pages instead of sixty-four as formerly. We are glad that, for the success of the magazine, the New York publishers have been so judiciously selected. The subscription is only $6 per annum, and each number is a small library in itself.

The Reason Why. Dick & Fitzgerald, New York.—"This is a careful collection of many hundreds of reasons for things which, though generally believed, are imperfectly understood. A book of condensed scientific knowledge for the million." So says the title page, and after a careful examination of the interior our only remark is, that "it is quite true."

Bibliotheca Sacra. Warren F. Draper, Andover, Mass.—The number of this profound theological review for this month contains nine able essays on various subjects. The first essay is on the "English Translations of the Bible," and is deeply interesting and instructive.

Household Words. Conducted by Chas. Dickens. Jansen & Co., New York.—The May number contains many interesting and amusing sketches, the ones entitled "Little Constance's Birthday" and "Civilization in California," being particularly worthy of mention.

Correspondents

S. Y. A. L., of D. C.—We entertain a high opinion of the philosopher to whom you refer, but his deductions in regard to colors are certainly behind, and not so satisfactory, as those of Newton, who deserves the most credit for his researches on this subject, although he was mistaken in many of his conclusions.

A. W. D., of Pa.—Transparent window shades are prepared by a primary thin coat of white varnish. You can purchase this varnish at any store where painters' materials are sold.

E. B., of N. H.—Oil made from sunflowers is used to adulterate linseed oil. The latter will make a varnish fully as transparent as the former. We have never seen a really pure white and transparent varnish devoid of smell, nor pure white shellac, but we think it may be bleached perfectly white with chlorine.

G. W., of Ill. and A. D., of Mich.—You should consult your physician in reference to the treatment of your diseases.

J. J. B. H., of Ind.—Volumes have been given to the public on the gyroscope, without adding a single golden grain to the treasury of useful knowledge. It would occupy too much space in our columns to give you the information desired on the subject.

J. M. B., of Pa.—Your views of the mercurial wheel are correct, but the machine you propose instead could not be made to work.

G. F. G., of Mich.—It would not be patentable to make a roofing compound of coal tar, rosin oil and sand, with cloth next to the boards. Roofing of this character has long been known to us.

E. D. T., of Pa.—Galvanized iron will last as long as tinned iron, but is not so easily soldered. We are not aware of its price. Address Vandervoort & Dickerson, No. 245 Water street, this city.

F. W. L., of N. Y.—A little whiskey or the oil of cloves added to a solution of gum arabic prevents it from souring, if kept in a covered vessel. The colors on japanned wares are baked or dried in ovens constructed for the purpose.

A. E. P., of N. Y.—By the use of magnifying single eye glasses, some engravers have altered the focus distances of their right eyes, but the cases of long and shortsightedness to which you refer were not thus caused.

P. A. P., of Fla.—The idea of propelling vessels by hinged paddles suspended on sliding frames on either side is a very old one, and long since abandoned as futile.

J. J. L., of N. Y.—There are cases on record of persons having been blind in one eye, and not aware of the fact until informed by their physician. Your case is not a very singular one.

F. & S., of Ky.—We do not recommend the use of gum catechu for preventing incrustations in boilers where soft water can be obtained, because it contains tannic acid, which will injure the iron, if, from any want of care, too much of it is employed.

J. D. and C. H., of N. Y.—Holtzapffel's work on turning is sold by Balliere, 290 Broadway, this city. It will perhaps furnish you with the desired information in regard to screw-cutting on the lathe.

S. Cochran, of Petersburg, Va., wishes manufacturers of grain cradle fingers and snaths, ready dressed and bent with the trimmings, to send him a list of prices.

R. F., of Conn.—We made the alteration in your communication in order to express an opinion deducicible from the latter part of the sentence to which you refer. If you did not intend to state a fact, or express an opinion, your words were idly used.

W. D. S., of N. Y.—Gold solder is composed of 24 parts gold, two of silver, and one of copper. Common spelter solder is composed of equal parts of lead and tin. Gold soldering is executed with the blow pipe.

Charles Meyers, of Fond du Lac, Wis., wishes to purchase a patent for the best machinery for making clothes' pins.

B. G. J., of Pa.—Liquid blue is not patented. It is made by neutralizing the acid on a strong solution of the sulphate of indigo, with chalk. A precipitate falls to the bottom of the vessel; the liquid left is a clear deep blue solution.

H. T. B., of Md.—If you have plenty of water on your low fall, an undershot wheel is the best you can use. We are unacquainted with the saw mill to which you refer.

G. J., of Ala.—We cannot recommend you a better substance for the protection of tenons and mortises in tressle work than coal tar. Paint it upon the tenons when moderately hot, and pour it into the mortises.

A. B. R., of Pa.—Soft buckskin or fine linen, we think, are superior to india-rubber for bullet patches. We have never heard of Sharp's rifles being liable to lead up in the grooves.

L. R., of Ill.—Two engines are employed on nearly all steamships, and each wheel has the benefit of both to produce an equable motion. You seem not to be aware of this fact.

J. M., of C. E.—Up to 1847 there had been granted in this country fourteen patents for improvements in the endless chain horse-power. The first patent seems to have been issued to Samuel Lane, of Hallowell, Me., in 1820. The endless chain power of Messrs. Wheeler, of Albany, was granted in 1841, and since that time it has been extensively used for threshing grain, sawing wood and other purposes.

G. M. E., of Pa.—The main cause operating against the success of a steam plow is the complication and expense attending its construction. There are many others of a minor character too numerous to be detailed here. Whether they will be overcome or not is for inventors who "know no such word as fail" to determine.

O. P. S., of Ohio.—It is a common device to suspend two objects, such as water wheels, on the same shaft so as to cause an equal degree of pressure to be exerted against both. Our government does not buy patent rights with a view of making them public property.

D. A. M., of Pa.—We believe the vulcanized gutta percha belting is a good article.

Money received at the Scientific American Office on account of Patent Office business, for the week ending Saturday, April 24, 1858 :—

G. S., of N. Y., $55; F. Y., of Ky., $27; J. H. H., of S. C., $30; W. W., of Miss., $55; J. T., of Mass., $35; T. J. R., of Ind., $35; L. P., of Del., $40; C. B. R., of Ill., $25; J. C. S., of Mass., $25; S. & G., of Mich., $30; J. P., of Tenn., $50; H. S. F., of Mass., $30; J. H. R., of N. Y., $30; A. & D., of Wis., $35; P. T. B., of Ill., $30; G. N., of Ohio, $20; E. D., of N. J., $100; T. S., of N. Y., $30; H. B., of N. Y., $250; J. D., of Mass., $25; E. K., of Conn., $30; J. F. T., of S. C., $30; H. A. N., of Mass., $25; J. A. O., of Conn., $30; A. A., of Ill., $30; S. N. C., of Ill., $20; W. Y. H., of Ill., $30; F. H. O., of Pa., $30; A. E. T., of Ohio, $30; N. H., of Pa., $25; E. S., of La., $30; O. S., of N. Y., $25; C. McJ., of N. J., $30; J. S. M., of Ill., $25; M. K., of N. J., $25; J. P. S., of N. Y., $25; W. V., Jr., of N. Y., $25; P. C. L., of L. I., $25.

Specifications and drawings belonging to parties with the following initials have been forwarded to the Patent Office during the week ending Saturday, April 24, 1858 :—

C. B. R., of Ill.; J. C. S., of Mass.; L. P., of Del.; G. S. M., of Ill.; J. M. H., of Pa.; J. T., of Mass.; F. Y., of Ky.; U. & B., of Ind.; M. K., of N. J.; H. A. N., of Mass.; G. N., of Ohio, (2 cases;) J. P. S., of N. Y.; J. S., of L. I.; W. V., Jr., of N. Y.; O. S., of N. Y.; P. C. L., of L. I.; G. S., of N. Y.; J. D., of Mass.

Science and Art.

A Hint to Farmers.

We have often been much surprised by noticing on farms otherwise perfect, that there was a want of regularity in the planting of the trees, vegetables and grain, and so we suggest that regularity in planting is one of the surest means of obtaining a good and equable crop. Even though it costs a little more labor at first, the fruit will amply repay. Give an equal share of soil to each root, and rather plant too little in a field than too much.

A Correspondent on Boiler Scale.

We have received a small box from C. C. Halladay, of Utica, Ill., containing incrustations three-eighths of an inch thick taken from the inside of a steam boiler. He says, in a letter accompanying them :—"The agent we use to destroy the scale is slippery elm—thanks to your journal for the information. As long as I live, you will be sure of one subscriber, and all others that I can induce to subscribe."

We do not doubt that twice the quantity of fuel will be required to generate steam in any boiler having such incrustations, in comparison with the quantity consumed beneath a clean boiler.

Detecting Incipient Fires in Ships.

On page 221, this volume, we published some very useful remarks regarding spontaneous combustion, and described a simple apparatus invented by Dr. Hay, Admiralty Chemist at Portsmouth, Eng., for detecting an increase of heat in the holds of ships and in close rooms. In answer to the information there presented, we have received a letter from Henry D. Fish, of Milford, Mass, in which he describes an apparatus similar in principle, but somewhat different in construction from that of Dr. Hay, for accomplishing the same objects and which he invented in October, 1856.

We would recommend Mr. Fish to devote more attention than he has yet done, to the general introduction of his invention, as the object designed to be accomplished by it is a good one.

Guthrie Center, Iowa.

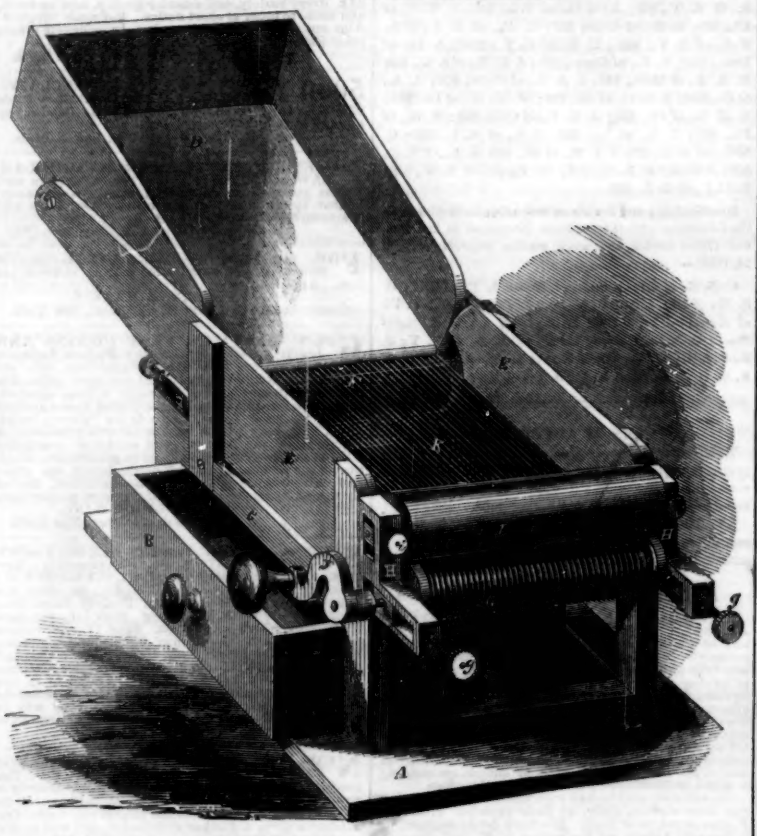
The citizens of Guthrie Center, Guthrie Co., Iowa, have just made a move in the right direction, and one which cannot fail to have a very beneficial effect on the future of this young town, one of the most inviting in the West. They have taken measures to establish a Mechanics' Library and Reading Room, and we are pleased to state that the SCIENTIFIC AMERICAN is among the first papers ordered. They have also directed E. B. Newton, Esq., of Guthrie Center, to give mechanics and others who may desire it, such information relative to the place as will be useful to those who may be desirous of trying a western home. Here, then, we have a frank acknowledgment of the worth and claims of *the mechanic*, a fact which indicates that the people of Guthrie Center understand that to encourage their mechanics and the mechanic arts is the most direct way of insuring their own success and prosperity.

Improved Pea Sheller.

Shelling peas for preserving or cooking is a tedious and somewhat laborious process, and as this vegetable is of no use until the shell has been removed, it is desirable that we should have some means or appliance by which we can easily remove the shell without in any way damaging the pea. Our engraving represents a sheller which fully accomplishes, by simple means, all that it is designed to do. It is the invention of W. J. Stevenson, of New York, and was patented by him March 30th, 1858.

A is the board on which it is placed, or the base from which rises the frame, C, carrying the drawer, B, and sides, E. The hopper, D, into which the peas are fed is supported on an axle, *d*, and it has a shaking motion given to it by means of the cams, *f*, on the roller, F. This roller, F, has around it a number of endless bands, K, which serve as conveyors for the peas, and pass round the roller, G, which may be grooved or otherwise, to keep the bands in position; the roller, G, is rotated by a handle, J. Above the roller, G, is a plane roller, I, placed somewhat behind, G, but yet in contact with it. I and G rest in the bearings, H, and the three rollers are put in any position, and the endless bands kept in any degree of tension by the screws and sliding journals, *i g f'*. The operation is as follows: When the peas are shaken out of the hopper they are brought by the endless bands to the rollers, I and G, and here it is necessary that the shell should be drawn through, but that the bite of the rollers should be so small as to

STEVENSON'S PEA SHELLER.



have a tendency to reject the peas and not draw them through. This difficulty is overcome in a very ingenious manner, the roller, I, being, (in relation to the peas) a little in advance of G, first comes in contact with the pea pod, this it presses down upon the endless bands, which being somewhat elastic, yield and split the pod, thus presenting the pod to pass between the rollers, I G, so that it will be drawn through and crushed, and at the same time the peas will be forced through the interstices of the bands into the drawer, B, beneath. To farmers who grow peas for seed, and market gardeners who prepare these healthy and nutritious vegetables for sale, this machine will prove invaluable, and they may obtain any further information by addressing the inventor, 438 Third avenue, New York.

Londinsky's Sad Iron Holder.

Fig. 1

Fig. 2

That domestic trouble, the washing day, often has its difficulties doubled by the burns and bruises which the laundress gets on her hands during the process of ironing. The method which careful housewives adopt to remedy this evil, the amount of paper they carefully fold together the day before, or the busy way in which the fingers of the juveniles are employed in stitching together pieces of cloth for the purpose of holding the sad iron, are often truly amusing; how grateful, then, will housekeepers be to us when we inform them that such trouble is no longer necessary, and that a simple little iron holder has been invented by Leon Londinsky, of New York, and patented by him June 2nd, 1857.

Our engravings illustrate the invention, Fig. 1 being a perspective view of the holder on the iron, and Fig. 2 being an end view of the holder only.

A A' are the two ends made of zinc or other metal plate, and turned over to admit two pieces of spring, B B', one at each end, between them and the handle, which is in two pieces—being cut through the center longitudinally; C is a small slotted piece fixed to the half end, A, in which works a pin on the half, A', that prevents the handle being opened beyond the tension of the spring; E E' are two pieces of wood attached to the bottom of the ends that serve as a shield to prevent the knuckles being burned by the radiated heat from the body of the iron; *a a* are parts of the end pieces turned at right angles to the end, and they being on each side of the iron handle, hinder the holder from shaking round the iron. The operation is simple:—The handle is grasped by the hand, the thumb and forefinger being passed through the loops seen in Fig. 1, the holder is then opened as in Fig. 2, and passed over the handle of the iron and the force of the spring is allowed to close it, and the iron is held firmly without fear of burning, as wood is interposed between the hand and the hot handle of the iron, and also between the hand and the body of the iron. The cost of manufacture of these useful additions to household economy is very trifling, and the patent with full machinery for their production is for sale.

Any further information can be obtained by addressing Messrs. Harris & Jacobson, 67 Nassau street, New York.

Book on the Sale of Patents.

We have received several letters inquiring of us if we know anything about the firm of Cornwall Bros., who are advertising in the SCIENTIFIC AMERICAN a book upon the sale of patents. Complaint is made that letters containing remittances for it are not answered. In some instances blame has been imputed to us for permitting the advertisement to appear in our columns. Now in regard to the firm above mentioned, we know nothing more of it than what is contained in the advertisement, and if those who seek to cast censure upon us will but exercise a little reflection, they will see that we cannot possibly vouch for the character of all the advertisers who make use of our columns. The gentlemen referred to will no doubt be able to make a satisfactory explanation.

The report of the building of the lighthouse off Belle Isle, Coast of France, and a statement of its stability by Leonor Fresnel, engineer of the works, has been translated and published for the benefit of the United States lighthouse service.